

## Ch.1 Review (first half of chapter)

1. The following data is the GPAs of students in an AP Stat class.

4.5	3.2	3.5	3.9	3.5	3.9
4.3	4.8	3.6	3.3	4.3	4.2
3.9	3.7	4.3	4.4	3.4	4.2
4.4	4	3.6	3.5	3.9	4

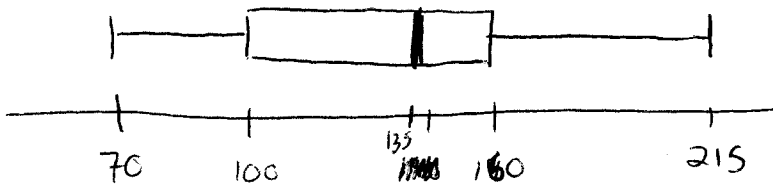
- Create a Stemplot of the data (at right)
- Describe your distribution (shape, center, spread, other deviations)

- roughly symm. - spread 32-48
- center  $\approx 39$

2. The total farm product indexes for the year 1919-1945 are as follows:

215	210	130	140	150	150	160	150	140	150
125	85	70	75	90	115	120	125	100	95
100	130	160	200	200	210				

Construct a boxplot of the data (horizontally below) and describe the distribution.



- roughly sym or slight
- center ~~1140~~ 135
- spread 70-5

3. Below are the yards per carry for the top rushers in the American Football Conference.

4.4	4.7	4.7	4.2	4.4	3.5	4.1	3.5	4.6	3.8
4.2	4.7	3.5	4.5	5.3	4.9	2.9	4.2	3.8	3.1

- a. Find the mean and standard deviation for the data

$$\bar{x} = 4.14 \quad s = 0.6142$$

$$h = 20$$

- b. Find the 5-number summary and test for outliers

min = 2.9      Med = 4.2      max = 5.3  
Q1 = 3.65      Q3 = 4.65

no outliers

- c. Determine which numerical summary is more appropriate. Justify.

- left skewed, so use 5# summary

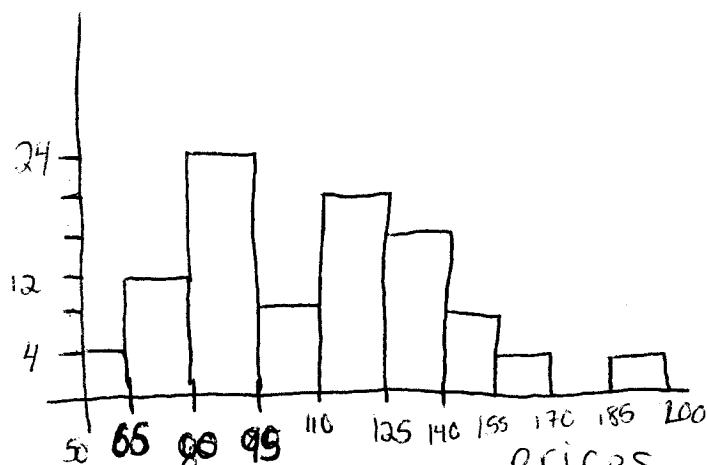
- d. If the worst rusher (the one with 2.9 ypc) suddenly has an awful season, and his yards per carry changes to 1.1, how does that affect our answers to parts a-c above?

$\bar{X}$  is affected, M is not,  
S " " / QR " "

4. Suppose the distribution of 25 advertised home prices (in thousands of dollars) in a certain community is given below:

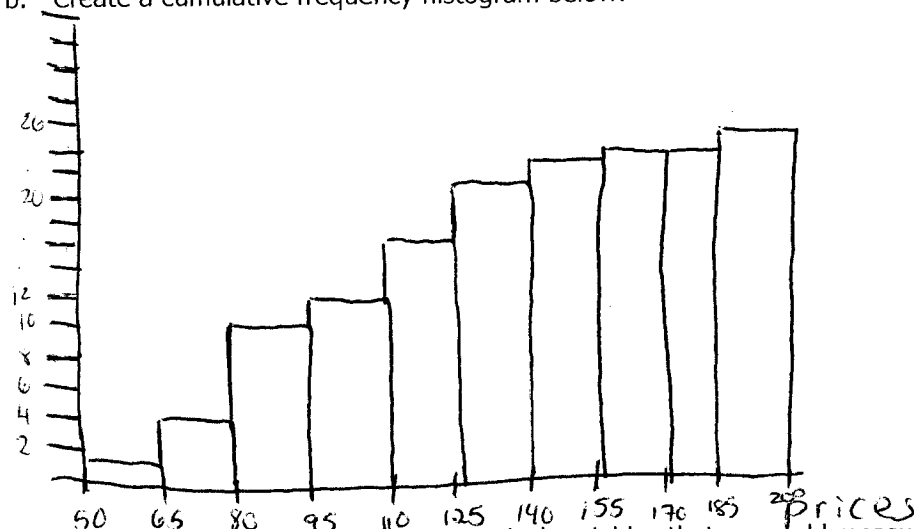
56	89	165	73	83	145	90	189	127	77	110	112	130
132	120	94	130	84	65	99	154	86	120	122	103	

- a. Create a relative frequency histogram and describe the distribution.



- Slight right sk
- Center btw 110°
- range 56 - 189
- poss. outlier @

- b. Create a cumulative frequency histogram below.



5. List 4 quantitative variables and 4 categorical variables that we could measure if the individuals we are observing are different cell phones.

Q

price  
weight  
cost of plan  
activation fee  
Size (area/volume)  
amt. of minutes/txts free per month

C

color  
brand  
provider  
full keyboard?  
blue tooth capabl.

# Ch. 1 Review (second half of chapter)

1. Given the distribution at right...

a. Verify that it is a density curve

$$(5)(0.2) = 1$$

b. What is the mean? The median? The quartiles?

$$\bar{x} = 2.5 \quad M = 2.5 \quad Q_1 = 1.25 \quad Q_3 = 3.75$$

c. What percent of the observations are between 0.2 and 2.5?

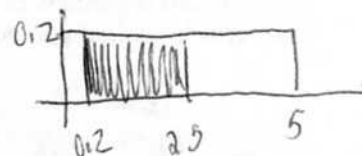
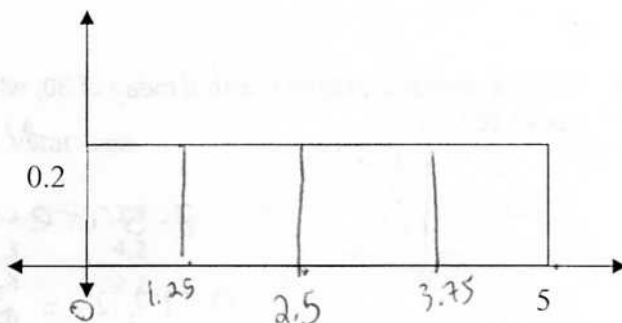
$$(0.2)(2.3) = 0.46$$

d. What percent of observations exceed 3.2?

$$(1.8)(0.2) = 0.36$$

e. What percent of the observations equal 1?

$$0 \leftarrow \text{line}$$



2. Assume that the distribution of scores on the Ch. 1 AP Stat test (overall, over the years) is known to be normally distributed with a mean of 70 and a standard deviation of 5.3.

a. What is the probability that students scores between an 80 and an 85?

$$P(80 < X < 85) = 0.00273$$

b. What is the probability that a student fails? (below a 60%)

$$P(X < 60) = 0.00296$$

c. What is the probability that a student scores between a C+ (77) and a B+ (87)?

$$P(77 < X < 87) = 0.0926$$

d. What is the probability that a student scores an A? (above a 93)

$$P(X > 93) = 7.14 \times 10^{-6}$$

$$7.14 \times 10^{-6}$$

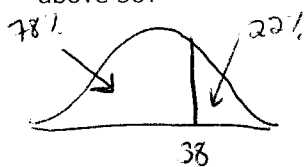
e. What score represents the 3<sup>rd</sup> quartile?

$$\text{invnorm}(0.75, 70, 5.3) = 73.57$$

f. What observation has 30% of the observations above it?

$$\text{invnorm}(0.70, 70, 5.3) = 72.78$$

3. Given a normal distribution with a mean of 30, what is the standard deviation if 22% of the values are above 38?



$$N(30, \sigma)$$

$$z\text{-score for } 38 = \text{invnorm}(0.78, 0, 1) = 0.7722$$

$$0.7722 = \frac{38 - 30}{\sigma}$$

$$\sigma = 10.36$$

4. You have taken 2 tests and scored a 73 on the math test and an 81 on the science test. The mean and standard deviations of the math test are 68 and 2.1 (respectively) and 78 and 3.2 for the science test. Which test did you do better on? Justify your answer.

math

$$z = \frac{73 - 68}{2.1} = 2.381$$

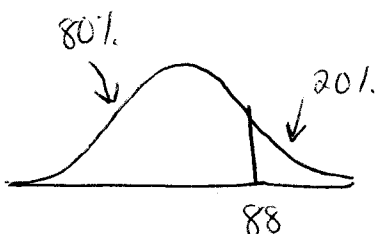
Science

$$z = \frac{81 - 78}{3.2} = 0.9375$$

\* better on math  $\rightarrow$  higher z-score, meaning more  $\sigma$  above its mean

5. Given a normal distribution with a standard deviation of 11, find  $\mu$  if 20% of the values fall above 88.

$$N(\mu, 11)$$



$$z\text{-score for } 88 = \text{invnorm}(0.80, 0, 1) = 0.8416$$

$$0.8416 = \frac{88 - \mu}{11}$$

$$9.2576 = 88 - \mu$$

$$\mu = 78.7424$$